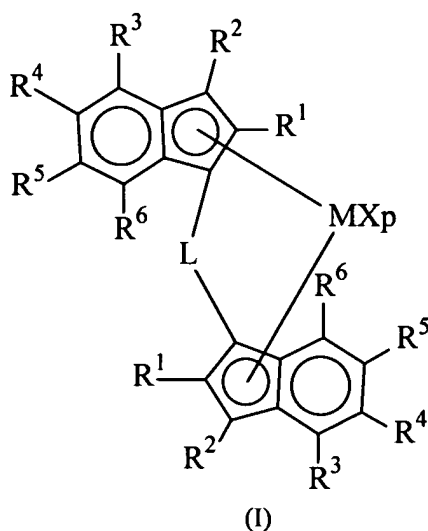


## AMENDMENTS TO THE CLAIMS

1. (currently amended) A process for preparing 1-butene polymers optionally containing up to 30% by mol of derived units of ethylene, propylene or an alpha olefin of formula  $\text{CH}_2=\text{CHZ}$ , wherein Z is a  $\text{C}_3\text{-C}_{10}$  alkyl group, comprising polymerizing 1-butene and optionally ethylene, propylene or said alpha olefin, in the presence of a catalyst system obtained by contacting:

a) at least a metallocene compound of formula (I):



wherein:

M is an atom of a transition metal selected from those belonging to group 4, 5, 6 or to the lanthanide or actinide groups in the Periodic Table of the Elements;

p is 2, being equal to the formal oxidation state of the metal M minus 2;

X, equal to or different from each other, are hydrogen atoms, halogen atoms, R, OR,  $\text{OSO}_2\text{CF}_3$ , OCOR, SR,  $\text{NR}_2$  or  $\text{PR}_2$  groups, wherein R is a linear or branched,  $\text{C}_1\text{-C}_{20}$  alkyl,  $\text{C}_3\text{-C}_{20}$  cycloalkyl,  $\text{C}_6\text{-C}_{20}$  aryl,  $\text{C}_7\text{-C}_{20}$  alkylaryl or  $\text{C}_7\text{-C}_{20}$  arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements; or a  $\text{OR}'\text{O}$  group wherein R' is a divalent radical selected from  $\text{C}_4\text{-C}_{20}$  alkylidene,  $\text{C}_6\text{-C}_{40}$  arylidene,  $\text{C}_7\text{-C}_{40}$  alkylarylidene or  $\text{C}_7\text{-C}_{40}$  arylalkylidene radicals;  $\text{R}^+$ , equal to or different from each other, are linear or branched,  $\text{C}_1\text{-C}_{20}$  alkyl,  $\text{C}_3\text{-C}_{20}$  cycloalkyl,  $\text{C}_6\text{-C}_{20}$  aryl,  $\text{C}_7\text{-C}_{20}$  alkylaryl or  $\text{C}_7\text{-C}_{20}$  arylalkyl radicals, optionally

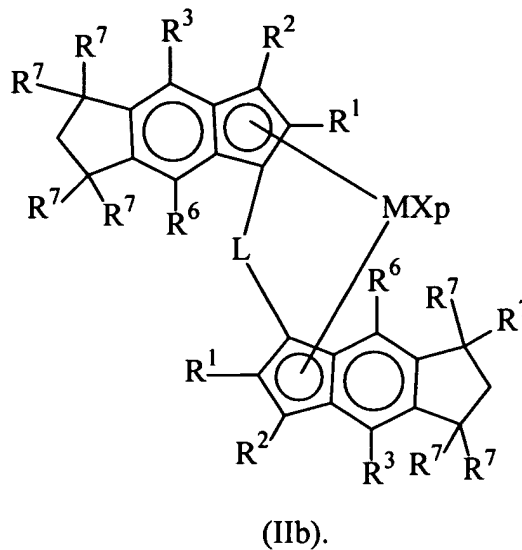
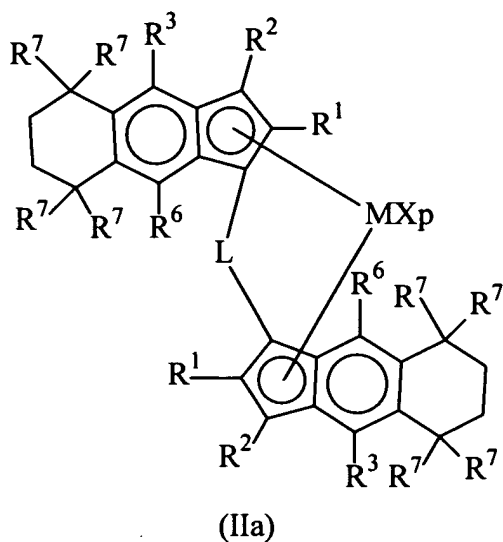
containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

$R^2$ ,  $R^3$  and  $R^6$ , equal to or different from each other, are hydrogen atoms or linear or branched,  $C_1$ - $C_{20}$ -alkyl,  $C_3$ - $C_{20}$ -cycloalkyl,  $C_6$ - $C_{20}$ -aryl,  $C_7$ - $C_{20}$ -alkylaryl or  $C_7$ - $C_{20}$ -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

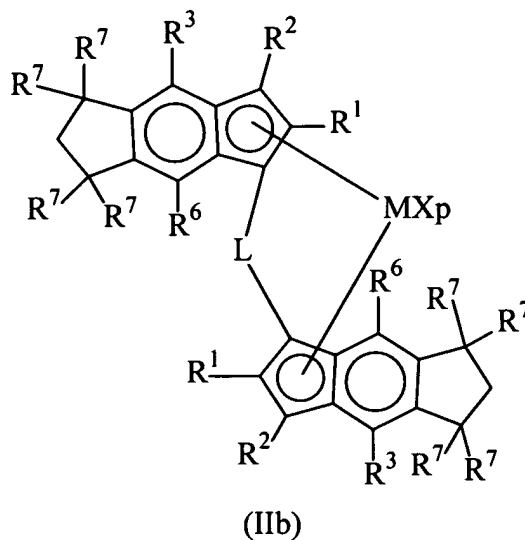
$R^4$  and  $R^5$ , form together a condensed saturated or unsaturated  $C_3$ - $C_7$  membered ring optionally containing heteroatoms belonging to groups 13-16 of the Periodic Table of the Elements; every atom forming said ring being substituted with  $R^7$  radicals wherein  $R^7$ , equal to or different from each other, are hydrogen atoms or linear or branched,  $C_1$ - $C_{20}$ -alkyl,  $C_3$ - $C_{20}$ -cycloalkyl,  $C_6$ - $C_{20}$ -aryl,  $C_7$ - $C_{20}$ -alkylaryl or  $C_7$ - $C_{20}$ -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

L is  $(R^8)_2$  wherein  $R^8$  is a linear or branched,  $C_1$ - $C_{20}$ -alkyl,  $C_3$ - $C_{20}$ -cycloalkyl,  $C_6$ - $C_{20}$ -aryl,  $C_7$ - $C_{20}$ -alkylaryl or  $C_7$ - $C_{20}$ -arylalkyl radical; and

- b) an alumoxane or a compound that forms an alkylmetallocene cation.
2. (original) The process according to claim 1 wherein the catalyst system further comprises an organo aluminum compound.
  3. (currently amended) The process according to claim 1, wherein in the compound of formula (I), ~~M is titanium, zirconium or hafnium; and X is a hydrogen atom, a halogen atom or an R group.~~
  4. (previously presented) The process according to claim 1 wherein  $R^1$  is a  $C_1$ - $C_{20}$ -alkyl radical;  $R^2$ ,  $R^3$  and  $R^6$  are hydrogen atoms and  $R^7$  is a hydrogen atom or a linear or branched,  $C_1$ - $C_{20}$ -alkyl radical.
  5. (previously presented) The process according to claim 1 wherein the compound of formula (I) has formula (IIa) or (IIb):



6. (previously presented) The process according to claim 1 wherein 1-butene is homopolymerized.
7. (currently amended) A metallocene compound of formula (IIb):



wherein

M is an atom of a transition metal selected from those belonging to group 4, 5, 6 or to the lanthanide or actinide groups in the Periodic Table of the Elements;

p is 2, being equal to the formal oxidation state of the metal M minus 2;

L is  $\text{Si}(\text{R}^8)_2$  wherein  $\text{R}^8$  is a linear or branched,  $\text{C}_1\text{-C}_{20}$ -alkyl,  $\text{C}_3\text{-C}_{20}$ -cycloalkyl,  $\text{C}_6\text{-C}_{20}$ -aryl,  $\text{C}_7\text{-C}_{20}$ -alkylaryl or  $\text{C}_7\text{-C}_{20}$ -arylalkyl radical;

$R^1$ , equal to or different from each other, are linear or branched,  $C_1$ - $C_{20}$ -alkyl,  $C_3$ - $C_{20}$ -cycloalkyl,  $C_6$ - $C_{20}$ -aryl,  $C_7$ - $C_{20}$ -alkylaryl or  $C_7$ - $C_{20}$ -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

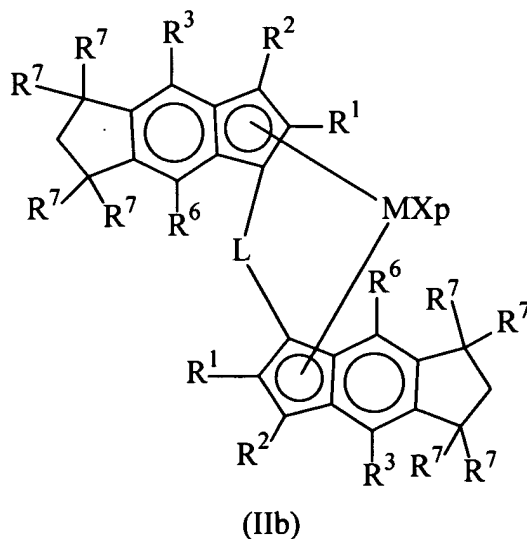
$R^2$ ,  $R^3$  and  $R^6$ , equal to or different from each other, are hydrogen atoms or linear or branched,  $C_1$ - $C_{20}$ -alkyl,  $C_3$ - $C_{20}$ -cycloalkyl,  $C_6$ - $C_{20}$ -aryl,  $C_7$ - $C_{20}$ -alkylaryl or  $C_7$ - $C_{20}$ -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

$R^7$ , equal to or different from each other, are linear or branched,  $C_1$ - $C_{20}$ -alkyl,  $C_3$ - $C_{20}$ -cycloalkyl,  $C_6$ - $C_{20}$ -aryl,  $C_7$ - $C_{20}$ -alkylaryl or  $C_7$ - $C_{20}$ -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

X, equal to or different from each other, are hydrogen atoms, halogen atoms, R, OR,  $OSO_2CF_3$ , OCOR, SR,  $NR_2$  or  $PR_2$  groups, wherein R is a linear or branched,  $C_1$ - $C_{20}$  alkyl,  $C_3$ - $C_{20}$  cycloalkyl,  $C_6$ - $C_{20}$  aryl,  $C_7$ - $C_{20}$  alkylaryl or  $C_7$ - $C_{20}$  arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements; ~~or a  $OR'O$  group wherein  $R'$  is a divalent radical selected from  $C_1$ - $C_{20}$ -alkylidene,  $C_6$ - $C_{40}$ -arylidene,  $C_7$ - $C_{40}$  alkylarylidene or  $C_7$ - $C_{40}$  arylalkylidene radicals.~~

8. (cancelled)

9. (currently amended) A process for preparing a metallocene compound of formula (IIb):



wherein

M is an atom of a transition metal selected from those belonging to group 4, 5, 6 or to the lanthanide or actinide groups in the Periodic Table of the Elements;

p is 2, being equal to the formal oxidation state of the metal M minus 2;

L is  $\text{Si}(\text{R}^8)_2$  wherein  $\text{R}^8$  is a linear or branched,  $\text{C}_1\text{-C}_{20}$ -alkyl,  $\text{C}_3\text{-C}_{20}$ -cycloalkyl,  $\text{C}_6\text{-C}_{20}$ -aryl,  $\text{C}_7\text{-C}_{20}$ -alkylaryl or  $\text{C}_7\text{-C}_{20}$ -arylalkyl radical;

$\text{R}^1$ , equal to or different from each other, are linear or branched,  $\text{C}_1\text{-C}_{20}$ -alkyl,  $\text{C}_3\text{-C}_{20}$ -cycloalkyl,  $\text{C}_6\text{-C}_{20}$ -aryl,  $\text{C}_7\text{-C}_{20}$ -alkylaryl or  $\text{C}_7\text{-C}_{20}$ -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

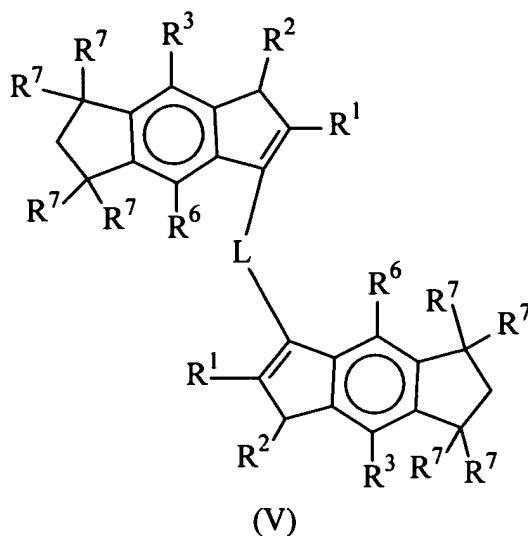
$\text{R}^2$ ,  $\text{R}^3$  and  $\text{R}^6$ , equal to or different from each other, are hydrogen atoms or linear or branched,  $\text{C}_1\text{-C}_{20}$ -alkyl,  $\text{C}_3\text{-C}_{20}$ -cycloalkyl,  $\text{C}_6\text{-C}_{20}$ -aryl,  $\text{C}_7\text{-C}_{20}$ -alkylaryl or  $\text{C}_7\text{-C}_{20}$ -arylalkyl radicals, optionally containing one or more heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements;

$\text{R}^7$ , equal to or different from each other, are linear or branched,  $\text{C}_1\text{-C}_{20}$ -alkyl,  $\text{C}_3\text{-C}_{20}$ -cycloalkyl,  $\text{C}_6\text{-C}_{20}$ -aryl,  $\text{C}_7\text{-C}_{20}$ -alkylaryl or  $\text{C}_7\text{-C}_{20}$ -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements;

X, equal to or different from each other, are ~~hydrogen atoms~~, halogen atoms,  ~~$\text{OR}$~~ ,  $\text{OSO}_2\text{CF}_3$ , or  $\text{OCOR}$ ,  ~~$\text{SR}$~~ ,  ~~$\text{NR}_2$~~  or  ~~$\text{PR}_2$~~  groups, wherein R is a linear or branched,  $\text{C}_1\text{-C}_{20}$  alkyl,  $\text{C}_3\text{-C}_{20}$  cycloalkyl,  $\text{C}_6\text{-C}_{20}$  aryl,  $\text{C}_7\text{-C}_{20}$  alkylaryl or  $\text{C}_7\text{-C}_{20}$  arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements; ~~or a  $\text{OR}^2\text{O}$  group wherein  $\text{R}^2$  is a divalent radical selected from  $\text{C}_1\text{-C}_{20}$  alkylidene,  $\text{C}_6\text{-C}_{40}$  arylidene,  $\text{C}_7\text{-C}_{40}$  alkylarylidene or  $\text{C}_7\text{-C}_{40}$  arylalkylidene radicals;~~

comprising the following steps:

a) contacting a ligand of formula (V):



or its double bond isomer

with a base of formula  $T_jB$  or  $TMgT^I$ , or sodium or potassium hydride, or metallic sodium or potassium; wherein B is an ~~alkaline or alkali-earth metal~~ alkali or alkaline earth metal and j is 1 or 2, j being equal to 1 when B is an alkaline metal, and j being equal to 2 when B is an alkali-earth metal; T is selected from the group consisting of linear or branched,  $C_1$ - $C_{20}$  alkyl,  $C_3$ - $C_{20}$  cycloalkyl,  $C_6$ - $C_{20}$  aryl,  $C_7$ - $C_{20}$  alkylaryl or  $C_7$ - $C_{20}$  arylalkyl groups, optionally containing at least one Si or Ge atom;  $T^I$  is a halogen atom or a group  $OR''$  wherein  $R''$  is a linear or branched,  $C_1$ - $C_{20}$ -alkyl,  $C_3$ - $C_{20}$ -cycloalkyl,  $C_6$ - $C_{20}$ -aryl,  $C_7$ - $C_{20}$ -alkylaryl or  $C_7$ - $C_{20}$ -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements; wherein the molar ratio between said base and the ligand of the formula (V) and is at least 2:1; and

b) contacting the product obtained in step a) with a compound of formula  $MX_4$ .

10. (cancelled)

11. (cancelled)

12. (previously presented) The process according to claim 5 wherein  $R^7$ , equal to or different from each other, are linear or branched,  $C_1$ - $C_{20}$ -alkyl,  $C_3$ - $C_{20}$ -cycloalkyl,  $C_6$ - $C_{20}$ -aryl,  $C_7$ - $C_{20}$ -alkylaryl or  $C_7$ - $C_{20}$ -arylalkyl radicals, optionally containing at least one heteroatom belonging to groups 13-17 of the Periodic Table of the Elements.

13. (previously presented) The process according to claim 12 wherein formula I is formula IIa.

14. (previously presented) The process according to claim 12 wherein formula I is formula IIb.